

# SLOVENSKI STANDARD SIST EN 13986:2003

01-april-2003

# Lesne plošče za uporabo v gradbeništvu - Lastnosti, ocenjevanje skladnosti in označevanje

Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking

Holzwerkstoffe zur Verwendung im Bauwesen - Eigenschaften, Bewertung der Konformität und Kennzeichnung TANDARD PREVIEW

Panneaux a base de bois destinés a la construction - Caractéristiques, évaluation de conformité et marquage

SIST EN 13986:2003

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Ta slovenski standard je istoveten z: EN 13986-2002

ICS:

79.060.01 Lesne plošče na splošno Wood-based panels in

general

SIST EN 13986:2003 en

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EUROPEAN STANDARD NORME EUROPÉENNE EUROPÄISCHE NORM

EN 13986

June 2002

ICS 01.040.79; 01.040.91; 79.060.01; 91.080.20

# **English version**

# Wood-based panels for use in construction - Characteristics, evaluation of conformity and marking

Panneaux à base de bois destinés à la construction -Caractéristiques, évaluation de conformité et marquage Holzwerkstoffe zur Verwendung im Bauwesen -Eigenschaften, Bewertung der Konformität und Kennzeichnung

This European Standard was approved by CEN on 7 April 2001.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION COMITÉ EUROPÉEN DE NORMALISATION EUROPÄISCHES KOMITEE FÜR NORMUNG

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# **Foreword**

This document EN 13986:2002 has been prepared by Technical Committee CEN/TC 112 "Wood-based panels", the secretariat of which is held by DIN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2002, and conflicting national standards shall be withdrawn at the latest by March 2004.

This document has been prepared under mandate M/113 given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU Directives.

For relationship with Council Directive 89/106/EEC, see the informative annex ZA, which is an integral part of this document.

No existing European Standard is superseded.

The annexes A and B are normative. Annex ZA is informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

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# 1 Scope

This European Standard defines wood-based panels for use in construction and specifies the relevant characteristics and the appropriate test methods to determine these characteristics for wood-based panels, unfaced, overlaid, veneered or coated:

- for internal use as structural components in dry conditions<sup>1)</sup>;
- for internal (or protected external) use as structural components in humid conditions<sup>2</sup>);
- for external use as structural components<sup>3)</sup>;
- for internal use as non-structural components in dry conditions<sup>1)</sup>;
- for internal (or protected external) uses as non structural components in humid conditions<sup>2</sup>;
- for external use as non-structural components<sup>3)</sup>;
- for internal use as structural floor decking on joists in dry<sup>1)</sup> or humid<sup>2)</sup> conditions;
- for internal use as structural roof decking on joists in dry<sup>1)</sup> or humid<sup>2)</sup> conditions;
- for internal use as structural wall sheathing on studs in dry<sup>1)</sup> or humid<sup>2)</sup> conditions.

It provides for the evaluation of conformity and the requirements for marking these products.

This standard covers wood-based panels in the form of solid wood panels, LVL<sup>4</sup>), plywood, OSB, particleboards (chipboards) either resin- or cement-bonded, wet process fibreboards (hardboards, medium boards, softboards) and dry process fibreboards (MDF) for use in construction. They may contain chemical agents to improve their reaction to fire and their resistance to biological attack/se.glaby.fungiland.insects:

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This standard is not intended to be applicable to wood-based panels for use in non-constructional applications.

# 2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 120, Wood-based panels — Determination of formaldehyde content — Extraction method called the perforator method.

EN 300, Oriented Strand Boards (OSB) — Definitions, classification and specifications.

EN 309, Wood particleboards — Definitions and classification.

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<sup>1)</sup> Dry conditions are defined in 3.8.2. Boards of this type are suitable for use in biological hazard class 1 of EN 335-3.

<sup>2)</sup> Humid conditions are defined in 3.8.3. Boards of this type are suitable for use in biological hazard classes 1 and 2 of EN 335-3.

<sup>3)</sup> External conditions are defined in 3.8.4. Boards of this type are suitable for use in biological hazard classes 1, 2, 3 and 4 of EN 335-3.

<sup>4)</sup> Standards for LVL are under development. LVL panels will not be covered by this standard until the product standard is published.

- EN 310, Wood-based panels Determination of modulus of elasticity in bending and of bending strength.
- EN 312-1, Particleboards Specifications Part 1: General requirements for all board types.
- EN 312-2, Particleboards Specifications Part 2: Requirements for general purpose boards for use in dry conditions.
- EN 312-3, Particleboards Specifications Part 3: Requirements for boards for interior fitments (including furniture) for use in dry conditions.
- EN 312-4, Particleboards Specifications Part 4: Requirements for load-bearing boards for use in dry conditions.
- EN 312-5, Particleboards Specifications Part 5: Requirements for load-bearing boards for use in humid conditions.
- EN 312-6, Particleboards Specifications Part 6: Requirements for heavy duty load-bearing boards for use in dry conditions.
- EN 312-7, Particleboards Specifications Part 7: Requirements for heavy duty load-bearing boards for use in humid conditions.
- EN 313-2, Plywood Classification and terminology Part 2: Terminology.
- EN 314-1, Plywood Bonding quality Part 1: Test methods.
- EN 314-2, Plywood Bonding quality Part 2: Requirements. (standards.iteh.ai)
- EN 316, Wood fibreboards Definition, classification and symbols.
- EN 317, Particleboards and fibreboards to Determination of swelling in thickness after immersion in water.
- EN 319, Particleboards and fibreboards Determination of tensile strength perpendicular to the plane of the board.
- EN 321, Fibreboards Cyclic tests in humid conditions.
- EN 326-1, Wood-based panels Sampling, cutting and inspection Part 1: Sampling and cutting of test pieces and expression of test results.
- EN 326-2, Wood-based panels Sampling, cutting and inspection Part 2: Quality control in the factory.
- EN 335-1, Durability of wood and derived products Definition of hazard classes of biological attack Part 1: General.
- EN 335-2, Durability of wood and wood-based products Definition of hazard classes of biological attack Part 2: Application to solid wood.
- EN 335-3, Durability of wood and wood-based products Definition of hazard classes of biological attack Part 3: Application to wood-based panels.
- EN 596, Timber structures Test methods Soft body impact test of timber framed walls.
- EN 622-1, Fibreboards Specifications Part 1: General requirements.
- EN 622-2, Fibreboards Specifications Part 2: Requirements for hardboards.
- EN 622-3, Fibreboards Specifications Part 3: Requirements for medium boards.
- EN 622-4, Fibreboards Specifications Part 4: Requirements for softboards.

EN 622-5, Fibreboards — Specifications — Part 5: Requirements for dry process boards (MDF).

EN 633, Cement-bonded particleboards — Definition and classification.

EN 634-2, Cement-bonded particleboards — Specifications — Part 2: Requirements for OPC-bonded particle-boards for use in dry, humid and exterior conditions.

EN 636-1, Plywood — Specifications — Part 1: Requirements for plywood for use in dry conditions.

EN 636-2, Plywood — Specifications — Part 2: Requirements for plywood for use in humid conditions.

EN 636-3, Plywood — Specifications — Part 3: Requirements for plywood for use in exterior conditions.

ENV 717-1, Wood-based panels — Determination of formaldehyde release — Part 1: Formaldehyde emission by the chamber method.

EN 717-2, Wood-based panels — Determination of formaldehyde release — Part 2: Formaldehyde release by the gas analysis method.

EN 789, Timber structures — Test methods — Determination of mechanical properties of wood-based panels.

EN 1058, Wood-based panels — Determination of characteristic values of mechanical properties and density.

EN 1087-1, Particleboards — Determination of moisture resistance — Part 1: Boil test.

ENV 1156, Wood-based panels — Determination of load and creep factors.

EN 1195, Timber structure — Test methods — Performance of structural floor decking.

ENV 1995-1-1, Eurocode 5 — Design of timber structures 139 Rart 131: General rules and rules for buildings.

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EN 12369-1, Wood-based panels — Characteristic values for structural design — Part 1: OSB, particleboards and fibreboards.

EN 12524, Building materials and products — Hygrothermal properties — Tabulated design values.

EN 12664, Thermal performance of building materials and products — Determination of thermal resistance by means of guarded hot plate and heat flow meter methods — Dry and moist products of medium and low thermal resistance.

EN 12775, Solid wood panels — Classification and terminology.

EN 12871, Wood-based panels — Performance, specification and requirements for load-bearing boards for use in floors, walls, and roofs.

ENV 12872, Wood-based panels — Guidance on the use of load-bearing boards in floors, walls and roofs.

EN 13353, Solid wood panels (SWP) — Requirements —<sup>5)</sup>.

prEN 13354, Solid wood panels — Bonding quality — Test method.

EN 13501-1, Fire classification of construction products and building elements — Part 1: Classification using test data from reaction to fire tests.

EN 20354, Acoustics — Measurement of sound absorption in a reverberation room (ISO 354:1985).

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<sup>5)</sup> To be published

EN ISO 12572:2000, Hygrothermal performance of building materials and products — Determination of water vapour transmission properties (ISO 12572:2001).

# Terms and definitions

For the purposes of this European Standard the following terms and definitions apply.

#### 3.1

# wood-based panel

solid wood panel, laminated veneer lumber (LVL), plywood, oriented strand board (OSB), resin-bonded particleboard, cement-bonded particleboard or fibreboard

# 3.2

# solid wood panel (SWP)

wood-based panel as defined in EN 12775 consisting of pieces of timber glued together on their edges and, if multi-layer, on their faces

# solid wood panel for internal use as a structural component in dry conditions

solid wood panel incorporating the performance characteristics from 4.1 that are relevant to board type SWP/1 in EN 13353

NOTE The performance characteristics relevant to SWP/1 in structural use and their requirements are given in Table A.1.

#### 3.2.2

# solid wood panel for internal use as a structural component in humid conditions

solid wood panel incorporating the performance characteristics from 4.2 that are relevant to board type SWP/2 in EN 13353 (standards.iten.ai)

NOTE The performance characteristics relevant to SWP/2 in structural use and their requirements are given in Table A.1.

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# 3.2.3

# 1f4156143fbd/sist-en-13986-2003 solid wood panel for external use as a structural component

solid wood panel incorporating the performance characteristics from 4.3 that are relevant to board type SWP/3 in EN 13353

NOTE The performance characteristics relevant to SWP/3 in structural use and their requirements are given in Table A.1.

#### 3.2.4

# solid wood panel for internal use as a non-structural component in dry conditions

solid wood panel incorporating the performance characteristics from 4.4 that are relevant to board type SWP/1 in EN 13353

NOTE The performance characteristics relevant to SWP/1 in non-structural use and their requirements are given in Table A.1.

# 3.2.5

# solid wood panel for internal use as a non-structural component in humid conditions

solid wood panel incorporating the performance characteristics from 4.5 that are relevant to board type SWP/2 in EN 13353

NOTE The performance characteristics relevant to SWP/2 in non-structural use and their requirements are given in Table A.1.

# 3.2.6

# solid wood panel for external use as a non-structural component

solid wood panel incorporating the performance characteristics from 4.6 that are relevant to board type SWP/3 in EN 13353

NOTE The performance characteristics relevant to SWP/3 in non-structural use and their requirements are given in Table A.1.

#### 3.3

#### laminated veneer lumber (LVL)

wood panel consisting of an assembly of layers bonded together with the direction of grain in adjacent layers usually parallel to each other.

NOTE Specification standards for laminated veneer lumber are under development.

#### 3.4

#### plywood

wood-based panel as defined in EN 313-2 consisting of an assembly of layers glued together with the direction of the grain in adjacent layers usually at right angles

#### 3.4.1

# plywood for internal use as a structural component in dry conditions

plywood incorporating the performance characteristics from 4.1 that are relevant to plywood in EN 636-1

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

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# plywood for internal use as a structural component in humid conditions

plywood incorporating the performance characteristics from 4.2 that are relevant to plywood in EN 636-2

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

# 3.4.3 (standards.iteh.ai)

# plywood for external use as a structural component

plywood incorporating the performance characteristics from 4.3 that are relevant to plywood in EN 636-3

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

#### 3.4.4

# plywood for internal use as a non-structural component in dry conditions

plywood incorporating the performance characteristics from 4.4 that are relevant to plywood in EN 636-1

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

# 3.4.5

# plywood for internal use as a non-structural component in humid conditions

plywood incorporating the performance characteristics from 4.5 that are relevant to plywood in EN 636-2

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

# 3.4.6

# plywood for external use as a non-structural component

plywood incorporating the performance characteristics from 4.6 that are relevant to plywood in EN 636-3

NOTE The performance characteristics relevant to this type of plywood and their requirements are given in Table A.2.

#### 3.5

# oriented strand board (OSB)

wood-based panel as defined in EN 300 as a multi-layered board made from strands of wood of a predetermined shape and thickness together with a binder. The strands in the external layers are aligned and parallel to the board length or width; the strands in the centre layer or layers can be randomly oriented, or aligned, generally at right angles to the strands of the external layers

#### 3.5.1

# OSB for internal use as a structural component in dry conditions

incorporating the performance characteristics from 4.1 that are relevant to board type OSB/2 in EN 300

NOTE The performance characteristics relevant to type OSB/2 and their requirements are given in Table A.3.

# 3.5.2

# OSB for internal use as a structural component in humid conditions

incorporating the performance characteristics from 4.2 that are relevant to board type OSB/3 (general structural use) or OSB/4 (heavy duty) in EN 300

NOTE The performance characteristics relevant to type OSB/3 and OSB/4 and their requirements are given in Table A.3.

#### 3.5.3

# OSB for internal use as a non-structural component in dry conditions

incorporating the performance characteristics from 4.4 that are relevant to board type OSB/1 in EN 300

NOTE The performance characteristics relevant to type OSB/1 and their requirements are given in Table A.3.

#### 3.5.4

# OSB for internal use as a non-structural component in humid conditions

incorporating the performance characteristics from 4.5 that are relevant to board type OSB/3 in EN 300

NOTE The performance characteristics relevant to type OSB/3 and their requirements are given in Table A.3.

#### iTeh STANDARD PREVIEW 3.6

# particleboard

(see: resin-bonded particleboard, cement-bonded particleboard) 1.21

#### 3.6.1

#### SIST EN 13986:2003 resin-bonded particleboard

wood-based panel as defined in EN 309 manufactured under pressure and heat from particles of wood (wood flakes, chips, shavings, sawdust and similar) and/or other lignocellulosic material in particle form (flax shives, hemp shives, bagasse fragments and similar) with the addition of an adhesive

# 3.6.1.1

# resin-bonded particleboard for internal use as a structural component in dry conditions

resin-bonded particleboard incorporating the performance characteristics from 4.1 that are relevant to board type P4 (load-bearing uses) in EN 312-4 or board type P6 (heavy duty load-bearing uses) in EN 312-6

NOTE The performance characteristics relevant to type P4 and P6 and their requirements are given in Table A.4.

# 3.6.1.2

#### resin-bonded particleboard for internal use as a structural component in humid conditions

resin-bonded particleboard incorporating the performance characteristics from 4.2 that are relevant to board type P5 (load-bearing uses) in EN 312-5 or board type P7 (heavy duty load-bearing uses) in EN 312-7

NOTE The performance characteristics relevant to type P5 and P7 and their requirements are given in Table A.4.

# 3.6.1.3

# resin-bonded particleboard for internal use as a non-structural component in dry conditions

resin-bonded particleboard incorporating the performance characteristics from 4.4 that are relevant to board type P2 in EN 312-2 (for general purpose uses) or board type P3 (for interior fitments forming part of the construction) in EN 312-3

NOTE The performance characteristics relevant to type P2 and P3 and their requirements are given in Table A.4.

#### 3.6.1.4

# resin-bonded particleboard for internal use as a non-structural component in humid conditions

resin-bonded particleboard incorporating the performance characteristics from 4.5 that are relevant to board type P5 in EN 312-5 (load-bearing uses) or board type P7 in EN 312-7 (heavy duty load-bearing uses)

NOTE The performance characteristics relevant to type P5 and P7 and their requirements are given in Table A.4.

#### 3.6.2

# cement-bonded particleboard

wood-based panel as defined in EN 633, manufactured under pressure, based on wood or other vegetable particles bonded with hydraulic cement and possibly containing additives

#### 3.6.2.1

# cement-bonded particleboard for use in dry, humid and exterior conditions

cement-bonded particleboard incorporating the performance characteristics from clause 4 that are relevant to cement-bonded particleboard in EN 634-2

NOTE The performance characteristics relevant to cement-bonded particleboard and their requirements are given in Table A.5.

# 3.7

#### fibreboard

wood-based panel as defined in EN 316 with a nominal thickness of 1,5 mm or greater, manufactured from lignocellulosic fibres with application of heat and/or pressure. The bond is derived from either

- the felting of the fibres and their inherent adhesive properties, or RFVIEW
- from a synthetic binder added to the fibres and ards.iteh.ai)

Other additives can be included

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# 3.7.1 hardboard

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# fibreboard as defined in EN 316 having a density of $\geq$ 900 kg/m<sup>3</sup>, manufactured from lignocellulosic fibre by the "wet process", i.e. having a fibre moisture content of more than 20 % at the forming stage and being produced under heat and pressure

# 3.7.1.1

# hardboard for internal use as a structural component in dry conditions

hardboard incorporating the performance characteristics from 4.1 that are relevant to board type HB.LA in EN 622-2

NOTE The performance characteristics relevant to type HB.LA and their requirements are given in Table A.6.

#### 3.7.1.2

# hardboard for internal use as a structural component in humid conditions

hardboard incorporating the performance characteristics from 4.2 that are relevant to board type HB.HLA1 or HB.HLA2 in EN 622-2

NOTE The performance characteristics relevant to type HB.HLA1 and HB.HLA2 and their requirements are given in Table A.6.

# 3.7.1.3

# hardboard for internal use as a non-structural component in dry conditions

hardboard incorporating the performance characteristics from 4.4 that are relevant to board type HB in EN 622-2

NOTE The performance characteristics relevant to type HB and their requirements are given in Table A.6.

#### 3.7.1.4

# hardboard for internal use as a non-structural component in humid conditions

hardboard incorporating the performance characteristics from 4.5 that are relevant to board type HB.H in EN 622-2

NOTE The performance characteristics relevant to type HB.H and their requirements are given in Table A.6.

# 3.7.1.5

# hardboard for external use as a non-structural component

hardboard incorporating the performance characteristics from 4.6 that are relevant to board type HB.E in EN 622-2

NOTE The performance characteristics relevant to type HB.E and their requirements are given in Table A.6.

#### 3.7.2

#### medium board

fibreboard as defined in EN 316 having a density of  $\geq$  400 kg/m<sup>3</sup> to < 900 kg/m<sup>3</sup>, manufactured from lignocellulosic fibres by the "wet process", i.e. having a moisture content of more than 20 % at the forming stage and being produced under heat and pressure. Low density medium boards have a density range of 400 kg/m<sup>3</sup> to < 560 kg/m<sup>3</sup> and high density medium boards have a density range of 560 kg/m<sup>3</sup>.

#### 3.7.2.1

# medium board for internal use as a structural component in dry conditions

medium board incorporating the performance characteristics from 4.1 that are relevant to board type MBH.LA1 (general structural use) or MBH.LA2 (heavy duty) in EN 622-3

NOTE The performance characteristics relevant to type MBH.LA1 and MBH.LA2 and their requirements are given in Table A.7.

# 3.7.2.2

# (standards.iteh.ai)

# medium board for internal use as a structural component in humid condtions

medium board incorporating the performance characteristics from 4.2 that are relevant to board type MBH.HLS1 (general structural use) or MBH.HLS2 (heavy duty) in EN 622-3 aff3a094-0c8e-4f05-99ea-

NOTE The performance characteristics relevant to type MBH.HLS1 and MBH.HLS2 and their requirements are given in Table A.7.

# 3.7.2.3

# medium board for internal use as a non-structural component in dry conditions

medium board incorporating the performance characteristics from 4.4 that are relevant to board type MBL or type MBH in EN 622-3

NOTE The performance characteristics relevant to types MBL and MBH and their requirements are given in Table A.7.

# 3.7.2.4

# medium board for internal use as a non-structural component in humid conditions

medium board incorporating the performance characteristics from 4.5 that are relevant to board type MBL.H or type MBH.H in EN 622-3

NOTE The performance characteristics relevant to types MBL.H and MBH.H and their requirements are given in Table A.7.

# 3.7.2.5

# medium board for external use as a non-structural component

medium board incorporating the performance characteristics from 4.6 that are relevant to board type MBL.E or type MBH.E in EN 622-3

NOTE The performance characteristics relevant to types MBL.E and MBH.E and their requirements are given in Table A.7.